

PROJECT SUMMARY

CRES 2006: Ecology, Integrity & Status of Deep Caribbean Coral Reefs

Institutions: University of Puerto Rico, Mayagüez (Appeldoorn, Ballantine, Yoshioka, Weil, Otero, Sherman, Pagan), Universidad Nacional de Colombia (Zea)

Supporting Governmental Agencies: NURP - Caribbean Marine Resource Center, NURP - Center for the North Atlantic and Great Lakes

Project Costs: Federal: \$1,499,975 Total: \$1,499,975 **Budget Period:** 5/1/06 -4/30/09

Deep Caribbean reefs are largely unexplored, mainly due to the limitations of submersibles, ROV's and AUV's. This program grows from expertise developed under CRES 2002 and consists of a multidisciplinary team (biology, geology, chemistry, physics) to study the biology and ecology of deep reefs off La Parguera, PR..

ROV surveys will guide initial work, but key to the program is the development of deep-diving (300fsw) capability for detailed manipulative work and sampling. Work capitalizes on the close proximity of UPRM's marine station to deep-reefs and adjacent shallow, CRES 2002 study sites. Research is driven by 24 specific hypotheses within 3 objectives: **Characterization** – species compositions and changes in space and time, disease prevalence and dynamics, genetic variability, reproduction and recruitment, plus the current and historical environment affecting reef distribution and function. Work includes still/video photography, specimen collection, repeat sampling and experimental manipulations. **Connectivity** – the relationship and ecological flow between deep and shallow reefs using taxonomic, genetic, reproductive and recruitment studies, and simulation modeling. Can deep reefs seed threatened shallow species, or are deep reefs dependent upon larval import from shallow reefs? **Vulnerability** – new/different species, small populations, slow growth and close proximity to land potentially make Caribbean deep reefs unique yet vulnerable to anthropogenic stress. A comparative site at Ponce, associated with a deep sewer outfall and river/harbor-borne sedimentation and turbidity will be studied in terms of species composition and distribution, disease prevalence and dynamics, reproduction, recruitment, and genetic variability under the assumption that all will be negatively impacted due to these (empirically measured) stressors.

The project utilizes the resources of the Caribbean Coral Reef Institute for program administration, webpage support and dissemination of results to pertinent management agencies. A scientific management committee will ensure proper scheduling and completion of all activities.